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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/081,624	02/20/2002	Jason L. Fuller	108298636US	1950
25096	7590	04/20/2005	EXAMINER	
PERKINS COIE LLP			HARAN, JOHN T	
PATENT-SEA			ART UNIT	
P.O. BOX 1247			PAPER NUMBER	
SEATTLE, WA 98111-1247			1733	

DATE MAILED: 04/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/081,624

Applicant(s)

FULLER ET AL.

Examiner

John T. Haran

Art Unit

1733

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 March 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 7-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-2 and 7-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 3/7/05 has been entered.

Affidavit

2. The declaration filed on 2/18/05 under 37 CFR 1.131 has been considered but is ineffective to overcome the Tandy reference (U.S. Patent 6,212,767).

The evidence submitted is insufficient to establish a conception of the invention prior to the effective date of the Tandy reference. While conception is the mental part of the inventive act, it must be capable of proof, such as by demonstrative evidence or by a complete disclosure to another. Conception is more than a vague idea of how to solve a problem. The requisite means themselves and their interaction must also be comprehended. See *Mergenthaler v. Scudder*, 1897 C.D. 724, 81 O.G. 1417 (D.C. Cir. 1897).

To establish conception prior to the effective date of a reference the evidence must show all the claimed features upon which the reference is relied. See MPEP 715.02. Tandy is relied upon for teaching a die attach machine with two separate die attach heads. Claims 1 and 10, recite first and second die attach heads of the same die

Art Unit: 1733

attach machine, but the declaration does not recite using a first and second die attach heads of the same die attach machine. Exhibit A does mention using a single die attach machine, but makes no mention of how many die attach heads it contains. It is conceivable to use a single die attach machine with a single die attach head to attach both the first die and the second die.

It is also noted that even if conception were to be established there does not appear to be sufficient evidence of diligence. See MPEP 715.07(a).

Claim Objections

3. Claim 2 is objected to because of the following informalities: the phrase "based die" should read - - base die - -. Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1, 2 and 7-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art in view of Lim et al (U.S. Patent 6,378,200), Tandy (U.S. Patent 6,212,767), and Leonard (U.S. Patent 6,071,371).

The admitted prior art is directed to a method for assembling microelectronic dies wherein a flip chip die is mounted on a substrate with a first die attach machine; then

Art Unit: 1733

the flip chip/substrate subassembly is heated to reflow solder bumps to attach the flip chip to the substrate; then the flip chip/substrate subassembly is transported to a second die attach machine for dispensing epoxy on the backside of the flip chip and mounting a wire bond chip to the epoxy; and then heating the stacked die assembly to cure the epoxy (Specification 0005). Additionally the process can be performed by using a single die attach machine and running the substrate through it twice, once to attach the flip chip and once to attach the wire bond chip (Specification 0006). The admitted prior art is silent towards using a single heating cycle to secure both the flip chip to the substrate and the wire bond chip to the flip chip and towards having a single die attach machine with first and second die attach heads wherein the substrate is moved from one die attach head to another.

It is generally well known and conventional in the assembly art when assembling a plurality of chips to a substrate to have a single die attach machine with a plurality of stations, each station with its own die attach head (pick and place tool), wherein at each station particular types of chips are applied to the substrate, the substrate is moved to the next station where different types of chips are applied to the substrate and after all the chips are mounted on the substrate, the substrate is moved to a heating means for heating the attachment means between the chips and substrates to securely attach the chips to the substrate, as shown for example in Lim et al (See Figure 1; Column 2, line 39 to Column 3, line 50). One skilled in the art would have readily appreciated the advantages of such a system over the method of the admitted prior art because it avoids having a plurality of separate die attach machines or running the substrate

Art Unit: 1733

through the same die attach machine multiple times and provides for one heating step rather than multiple thereby increasing the efficiency as further evidenced by Tandy and Leonard et al.

Tandy is directed to a method of assembling a stacked die package wherein a first die is attached to a support substrate via a heat curable adhesive in a die attach machine containing a first die attach head and then a second die is mounted on top of the first die with a heat curable adhesive via a pick and place device (second die attach head) (See Figure 11; Column 3, lines 13-18, line 45-46, and lines 56-57). Tandy also teaches using a pick and place device to place a second die on a first die with adhesive therebetween, then attaching the stacked die to a support structure with adhesive therebetween, and then simultaneously curing the adhesive between the dies and the adhesive between the bottom die and the support (Column 4, lines 25-40). Tandy teaches that this method is preferable because it only uses one die attach machine and eliminates the need to send the support substrate through a die attach machine twice, once to attach the first die and once to attach the second die and it avoids having two heating steps (Column 1, lines 21-26; lines 47-67 and Column 2, lines 13-16). While the language of Tandy appears to teach the pick and place tool (second die attach head) is separate from the die attach machine (with the first die attach head), Tandy is essentially teaching a single machine (or system) that has two separate die attach stations with separate die attach heads (or devices).

Leonard et al is directed towards a method for bonding two dies to a circuit board, one via solder and the other via curable adhesive and teaches that it is

Art Unit: 1733

preferable to perform one heating cycle to both reflow the solder and cure the adhesive rather than two separate heating cycles, one for the solder and one for the adhesive, because the additional heating has detrimental effects and is inefficient (Column 1, line 40 to Column 2, line 40).

One skilled in the art would have readily appreciated that the collective teachings of Lim et al, Tandy, and Leonard et al point out the inefficiencies of the admitted prior art and suggest modifying the method of the admitted prior art to have a single die attach machine with two die attach stations, each with its own die attach head, wherein the flip chip is mounted on the substrate at the first station by a first die attach head, is transported directly to a second station wherein the wire bond chip is mounted on the flip chip by a second die attach head and then the entire assembly is transported to a heating means for heating the solder and adhesive simultaneously in a single heating cycle to attach the flip chip to the substrate and the wire bond chip to the flip chip. Such a method would have increased efficiency and productivity as suggested in Lim et al, Tandy, and Leonard et al.

Regarding claims 1, 2, and 7-11, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of the admitted prior art as suggested above by the collective teachings of Lim et al, Tandy, and Leonard et al in order to increase the efficiency and productivity of the admitted prior art.

Art Unit: 1733

6. Claims 1, 2 and 7-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art in view of Lim et al (U.S. Patent 6,378,200) and Leonard (U.S. Patent 6,071,371).

The admitted prior art is directed to a method for assembling microelectronic dies wherein a flip chip die is mounted on a substrate with a first die attach machine; then the flip chip/substrate subassembly is heated to reflow solder bumps to attach the flip chip to the substrate; then the flip chip/substrate subassembly is transported to a second die attach machine for dispensing epoxy on the backside of the flip chip and mounting a wire bond chip to the epoxy; and then heating the stacked die assembly to cure the epoxy (Specification 0005). Additionally the process can be performed by using a single die attach machine and running the substrate through it twice, once to attach the flip chip and once to attach the wire bond chip (Specification 0006). The admitted prior art is silent towards using a single heating cycle to secure both the flip chip to the substrate and the wire bond chip to the flip chip and towards having a single die attach machine with first and second die attach heads wherein the substrate is moved from one die attach head to another.

It is generally well known and conventional in the assembly art when assembling a plurality of chips to a substrate to have a single die attach machine with a plurality of stations, each station with its own die attach head (pick and place tool), wherein at each station particular types of chips are applied to the substrate, the substrate is moved to the next station where different types of chips are applied to the substrate and after all the chips are mounted on the substrate, the substrate is moved to a heating means for

Art Unit: 1733

heating the attachment means between the chips and substrates to securely attach the chips to the substrate, as shown for example in Lim et al (See Figure 1; Column 2, line 39 to Column 3, line 50). One skilled in the art would have readily appreciated the advantages of such a system over the method of the admitted prior art because it provides for one heating step rather than multiple thereby increasing the efficiency as further evidenced by Leonard et al.

Leonard et al is directed towards a method for bonding two dies to a circuit board, one via solder and the other via curable adhesive and teaches that it is preferable to perform one heating cycle to both reflow the solder and cure the adhesive rather than two separate heating cycles, one for the solder and one for the adhesive, because the additional heating has detrimental effects and is inefficient (Column 1, line 40 to Column 2, line 40).

One skilled in the art would have readily appreciated that the collective teachings of Lim et al and Leonard et al point out the inefficiencies of the admitted prior art and suggest modifying the method of the admitted prior art to have a single die attach machine with two die attach stations, each with its own die attach head, wherein the flip chip is mounted on the substrate at the first station by a first die attach head, is transported directly to a second station wherein the wire bond chip is mounted on the flip chip by a second die attach head and then the entire assembly is transported to a heating means for heating the solder and adhesive simultaneously in a single heating cycle to attach the flip chip to the substrate and the wire bond chip to the flip chip. Such

a method would have increased efficiency and productivity as suggested in Lim et al and Leonard et al.

Regarding claims 1, 2, and 7-11, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of the admitted prior art as suggested above by the collective teachings of Lim et al and Leonard et al in order to increase the efficiency and productivity of the admitted prior art.

Response to Arguments

7. Applicant's arguments filed 2/18/04 have been fully considered but they are not persuasive.

As noted above the affidavit filed on 2/18/05 in an attempt to swear behind Tandy (U.S. Patent 6,212,767) is considered ineffective.

Applicant's alternative arguments that the rejection of the claims is improper even if Tandy is available as a reference are not found to be persuasive. Applicant argues that the admitted prior art teaches away from stacking a first stacked die onto the backside of the base die before securing the base die to the substrate in a heating cycle. Just because the admitted prior art did not envision Applicant's invention does not mean the admitted prior art teaches away from it. The collective teachings of Leonard, Lim, and Tandy teach the efficiency of using one heating cycle to a plurality of dies rather than using a separate heating cycle to attach each individual die separately and one skilled in the art would have been amply motivated to have one heating cycle in

Art Unit: 1733

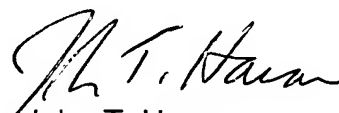
the method of the admitted prior art. It is also note that Leonard is relied upon for this general teaching and not for the specifics of how or when the dies are attached.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to John T. Haran whose telephone number is (571) 272-1217. The examiner can normally be reached on M-Th (8 - 5) and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Blaine Copenheaver can be reached on (571) 272-1156. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


John T. Haran
Examiner
Art Unit 1733